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ABSTRACT

Despite pressure for faculty to infuse technology into their teaching, little data exist on the extent to which technology-enhanced instruction in higher education is actually effective in helping faculty members reach instructional goals. This poster shares the results of a pre-post-course evaluation study conducted to assess the extent to which a variety of standard and instructor-modified modules within WebCT were effective in increasing student learning, motivation, and technology use and skill. One hundred and fourteen undergraduates in the same 300-level child development course completed pre-post course surveys. Results show that students used the web-based tools extensively. Statistically- and practically-significant pre-post changes were observed for students' technology use, skill, and enjoyment, and a reduction in student computer anxiety was also observed. Most students perceived the web-based tools to be quite useful for improving student learning, student motivation, and course communication. Use of the online tools was positively associated with performance in the course. (Author)

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Increasing Student Learning, Technology Use, and Computer Skills via Use of WebCT in an Undergraduate Child Development Course: A Pre-Post Course Evaluation Study

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ABSTRACT

Despite pressure for faculty to infuse technology into their teaching, little data exist on the extent to which technology-enhanced instruction in higher-education is actually effective in helping faculty members reach instructional goals. This poster shares the results of a pre-post-course evaluation study conducted to assess the extent to which a variety of standard and instructor-modified modules within WebCT were effective in increasing student learning, motivation, and technology use and skill. 114 undergraduates in three sections of the same 300-level child development course completed pre-post course surveys. Results show that students used the web-based tools extensively. Statistically- and practically-significant pre-post changes were observed for students' technology use, skill, and enjoyment, and a reduction in student computer anxiety was also observed. Most students (76-86%) perceived the web-based tools to be quite useful for improving student learning, student motivation, and course communication. Use of the online tools was positively associated with performance in the course.

INTRODUCTION / RATIONALE

• Faculty are often strongly encouraged or even required to integrate technological teaching tools into their courses because it is assumed that doing so leads to increased student learning and higher levels of student technology proficiency.

• Little data exist, however, on the extent to which technology-enhanced instruction in higher-education is actually effective in helping faculty members reach such instructional goals.

• This poster shares the results of a pre-post-course evaluation study conducted to assess the extent to which the using a variety of standard and instructor-modified modules within WebCT was effective in reaching the following pedagogical goals:

a) increase student learning
b) increase student motivation
c) increase student-student and student-instructor communication
d) increase student technology use
e) increase student technology skills
f) decrease student technology anxiety/fear

METHOD

PARTICIPANTS

- ***114 Undergraduates***
  - 82% Female Age in Years $\underline{M} = 23.1$ $(\underline{SD} = 6.5)$
  - 1% Freshman, 33% Sophomore, 35% Junior, 30% Senior, 1% Other

- ***Across 3 Sections of Psyc 313 - "Child Psychology"***
  - Section 1 = Fall Semester 1999 $(\underline{N} = 30)$
  - Section 2 = Spring Semester 2000 $(\underline{N} = 40)$
  - Section 3 = Spring Semester 2000 $(\underline{N} = 44)$
  - Same instructor and syllabus

SURVEY

- Pre (first day of class) and post -course (last day of class) author-constructed paper-and-pencil survey (Sections 2 & 3) (see APPENDIX 1)

- Post-course (last day of class) (retrospective pre-post) author-constructed survey (Section 1 only)

- Surveys tapped the students':
  - Frequency of technology use (pre & post) (1 = never, 5 = daily)
  - Proficiency with technology (pre & post) (1 = never used, 5 = expert)
  - Fear/Anxiety/Enjoyment of technology (pre & post) (5 = extreme)
  - Perceptions of the usefulness of each of the course technology components for facilitating learning, motivation, and communication in the course. (1 = not useful, 5 = extremely useful)

WEB-BASED COURSE TOOLS

Within an individually-tailored WebCT environment, the following technology-mediated course resources were used:

1) <u>Downloadable Course Materials</u> – Various course documents (syllabus, instructions for the course paper, guidelines for the web-based assignment, final exam study sheet etc.) were available online.

(Required – only way to get certain documents)

2) <u>Online discussion</u> – Asynchronous, un-moderated, online discussion about course process and content, and how course content relates to students' lives.

(Optional Extra Credit – up to 5 XC points given at the rate of .5 points per reasonable post).

3) <u>Online Student-Generated Study Guide</u> – Students submitted weekly MC and T/F exam items related to lecture material to a private forum originally viewable only by the student and the instructor. The instructor then individually approved items submitted (or rejected them with feedback given) and forwarded them into a forum viewable by the whole class. Each week, the instructor also moved one student-submitted item to a special student-viewable folder of items known to appear on the next exam. About 50% of the MC and T/F items that appeared on the exams came from the student-submitted items.

(Required for the first 5 approved items – additional optional approved items yielded 1 XC point up to a total of 5 points at a maximum of 1 point per week)

4) <u>Online Grade Checking Mechanism</u> - Students could get an update of their own current course grades anytime during the course, updated weekly.

(Optional - but only way for students to see their grades)

WEB-BASED COURSE TOOLS (CONT.)

5) Online Practice Quizzes - Students could take practice quizzes online via a link to the textbook publishers' online chapter quizzes from the book.

(Optional)

6) GMU's Online Resources for Developmental Psychology (ORDP) – A link to this useful web resource site was provided. This is an organized and user-friendly collection of the best, most informative, and comprehensive websites available to date on topics related to human development. http://classweb.gmu.edu/awinsler/ordp/

(Required – as a vehicle to access parenting websites that the students needed to review and critique as part of a web-based assignment)

(Optional – as a general supplementary reading resource)

RESEARCH QUESTIONS

1) To what extent do students actually use the web-based course tools?

2) Are there pre-post-course gains in students' self-reported technology use, skill, and attitude?

3) Do the students see the web-based course tools as being useful for increasing learning, motivation, and communication?

4) To what extent is use of the web-based course tools associated with student performance in the course?

RESULTS

1) To what extent do students actually use the web-based course tools?

- 100% of the students in the course used WebCT at least once throughout the semester.
- The mean number of WebCT "hits" per semester, per student was 395.2 (SD = 236.4)
- The mean number of posts by students (discussion contributions and items submitted for the study guide combined) was 14.11 (SD = 11.33).
- The average total number of posts to WebCT per course was 830.

Conclusion - Students used the course technology extensively. Given that students were only required to post 5 times throughout the semester, and they were never required to contribute to the online discussion forum, these numbers indicate significant, voluntary, and frequent use of instructional technology by students in the course.

RESULTS

2) Are there pre-post-course gains in students' self-reported technology use, skill, and attitude?

Table 1. Pre- and post-course student self-reported technology use, skill, and anxiety/enjoyment

TECHNOLOGY USE	Pre-Course	Post-Course
Word processors (e.g. MS Word)	**3.74**	**3.97***
Spreadsheets (e.g. MS Excel)	1.96	1.99
Graphics Programs	1.89	1.92
Email		
General (e.g. Friends, family members, teachers)	4.56	4.61
Listserves (e.g. Fanclubs, courses)	**2.66**	**3.10***
Internet (WWW)		
General (e.g. Browsing for jokes, recipes, daily news, etc.)	3.53	3.67
Live Chat Room	1.58	1.71
Asynchronous Discussion	**1.73**	**2.77***
Searched for Information	**3.74**	**3.89+**
Researched Topics for Class	**3.17**	**3.66***
Made purchases on-line	1.69	1.82
Library Electronic Resources	**2.55**	**3.08***
Webpage Authoring Programs (e.g. Frontpage, Composer)	**1.66**	**2.07***
TECHNOLOGY SKILL	**Pre-Course**	**Post-Course**
Word processors (e.g. MS Word)	3.95	3.88
Spreadsheets (e.g. MS Excel)	2.39	2.44
Graphics Programs	**1.96**	**2.18***
Email		
General (e.g. Friends, family members, teachers)	**4.42**	**4.22***
Listserves (e.g. Fanclubs, courses)	**2.93**	**3.14***
Internet (WWW)		
General (e.g. Browsing for jokes, recipes, daily news, etc.)	3.78	3.78
Live Chat Room	2.36	2.37
Asynchronous Discussion	**2.37**	**3.18***
Searched for Information	3.72	3.83
Researched Topics for Class	3.65	3.73
Made purchases on-line	2.46	2.41
Library Electronic Resources	**2.93**	**3.34***
Webpage Authoring Programs (e.g. Frontpage, Composer)	**1.96**	**2.19+**
Overall Skill	**3.45**	**3.89***
TECHNOLOGY FEAR/ENJOYMENT	**Pre-Course**	**Post-Course**
Anxiety/Fear	**1.98**	**1.60***
Enjoyment	**3.33**	**3.86***

* $p < .05$ + $p < .10$

RESULTS

3) Do the students see the web-based course tools as being useful for increasing learning, motivation, and communication?

Table 2. Students' perceived usefulness of the web-based course tools for improving learning, motivation, and communication

	1 Not Useful	2 Slightly Useful	3 Useful	4 Very Useful	5 Extremely Useful	M	Mode	% 3 or above
IMPROVING LEARNING								
On-line Discussion	14.3%	31.2%	35.1%	13.0%	6.5%	2.64	3	54.6%
On-line Grade Posting	2.6%	6.6%	25.0%	31.6%	34.2%	4.05	5	90.8%
On-line Study Guide	.	2.6%	15.8%	25%	56.6%	4.27	5	97.4%
Resource Links	6.6%	13.2%	42.1%	15.8%	22.4%	3.32	3	80.3%
Web Course Handouts	2.6%	5.3%	32.9%	31.6%	27.6%	3.98	3	92.1%
On-line Quizzes	11.1%	15.6%	35.6%	20%	17.8%	3.23	3	73.4%
OVERALL	**2.6%**	**10.5%**	**25%**	**44.7%**	**17.1%**	**3.90**	**4**	**86.8%**
INCREASING STUDENT MOTIVATION								
On-line Discussion	19.7%	18.4%	31.6%	22.4%	7.9%	2.75	3	61.9%
On-line Grade Posting	5.3%	3.9%	28.9%	28.9%	32.9%	3.75	5	90.7%
On-line Study Guide	3.9%	6.6%	21.1%	30.3%	38.2%	3.75	5	89.6%
Resource Links	10.5%	23.7%	25%	22.4%	18.4%	3.07	3	65.8%
Web Course Handouts	6.6%	9.2%	35.5%	27.6%	21.1%	3.66	3	84.2%
On-line Quizzes	17.4%	13%	32.6%	19.6%	17.4%	3.11	3	69.6%
OVERALL	**2.7%**	**12%**	**37.3%**	**29.3%**	**18.7%**	**3.60**	**3**	**85.3%**
FACILITATING COMMUNICATION								
On-line Discussion	14.5%	17.1%	35.5%	17.1%	15.8%	3.1	3	68.4%
On-line Grade Posting	5.3%	13.2%	34.2%	21.1%	26.3%	3.7	3	81.6%
On-line Study Guide	3.9%	13.2%	35.5%	22.4%	25%	3.6	3	82.9%
Web Course Handouts	6.7%	10.7%	38.7%	16%	28%	3.7	3	82.7%

RESULTS

5) To what extent is use of the web-based course tools associated with student performance in the course?

Table 3. Pearson correlations between student WebCT use in the course and course performance.

	Exam 1	Final Exam	Final Course Grade
Number of WebCT "Hits"	.37*	.31*	.59*
Number of WebCT "Reads"	.34*	.36*	.56*
Number of WebCT "Posts"	.27*	.37*	.55*

- Students who often used the web-based course tools did better in the course than those who used the tools less frequently.
- Positive associations between WebCT use and performance were still found even when only those students who earned a final grade of 75 or less were included, showing that this finding is not due to the possibility that only the best students were taking advantage of the learning tools.

Misc. Other Findings:

- Frequency of student use of course technology ($r = .34$, $p < .05$), and NOT technology skill ($r = .00$, ns), was associated with course performance.
- Computer fear/anxiety at the beginning of the course was negatively associated with performance on the first exam ($r = -.25$, $p < .05$), but not associated with performance by the end of the course – instead, post-course technology enjoyment was linked with course success ($r = .27$, $p < .05$).
- 61.8% of the students reported that technology use will be important in their choice of future courses, and 80% reported that they would recommend other professors to use technology in a similar way in their classrooms.

CONCLUSIONS

• The data clearly indicate that students' technology use and skill were increased, emotional barriers to technology were overcome, student motivation was enhanced, and content learning in child development was increased via the systematic, creative, and carefully-planned use of the WebCT learning tools.

• We were delighted with the extent to which these web-based learning tools helped reach our pedagogical goals.

• Successful implementation of course technology takes considerable time and effort. The tool deemed most effective by the students (the on-line study guide) was that which involved the most creativity, time, and careful moderation on the part of the instructor.

• The on-line discussion was especially useful as a forum for students to share their own anecdotal experiences with the child development course content (i.e., "I have a sister who does that with her 8-year-old…") without taking up too much class time.

• Evaluation and implementation research such as that presented here is critically needed in the scholarship of teaching -- so we can tell what works well, with and for whom, and under what circumstances.

• Limitations of this study include the lack of a control group (students going through the same course at the same time but without the technology), and the inability to control for, or measure, course-based technology experiences gained by the participating students in other courses taken the same semester.

• The authors are happy to share websites, ideas, syllabi, assignments etc. with interested instructors.

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